USING GRADES
FOR
ADMISSIONS

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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VED PRAKASH

NCERT

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FOREWORD

Transparent and credible assessment of students' performance are of paramount importance. To make the best possible use of educational facilities it is necessary to employ measures that provide reliable and valid estimates of students' performance and potential. The use of numerical marking system has always been a subject of severe criticism because of a number of imperfections that it suffers from. Alternative evaluation procedures have been suggested from time to time. Of them, grading system is considered to be a superior method of assessing students' performance.

We at the National Council of Educational Research and Training (NCERT) are quite conscious of the fact that all possible methods used for assessment of students' potential have problems. We feel, of those used so far, grading is far more superior a method than others. The issue of introduction of grades has been quite widely and intensively debated by us at the NCERT. In March, 2000 we came out with a monograph on "Grading in Schools". It has been very well received at different levels, particularly by the academic community.

Although convinced of its superiority, some have started questioning its feasibility for promotion and placement of students, particularly when the number of aspirants outnumber the available opportunities. This has given us the opportunity to work out a model which can be of help in overcoming such impediments. The present document represents an attempt to resolve issues which have been raised.

I take this opportunity to congratulate my colleague, Professor Ved Prakash, Head, Department of Educational Measurement and Evaluation, for his untiring efforts in working out the proposed model

and bringing out the document in its present from. I trust that readers and users will find it both interesting and useful. As always, the NCERT will be grateful for constructive suggestions.

J.S. RAJPUT
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New Delhi
15 November 2001

PREFACE

Education in a welfare state is an expensive proposition. It is, therefore, absolutely imperative that we make the most out of it by way of ensuring both the opportunity to learn and the acquisition of quality education by one and all. The most essential ingredients that we need to know in this entire process are the interest of the learner and his or her pace of learning. This requires that educational progress of every individual learner be carefully and honestly watched and reported as precisely as possible. There may be various ways of doing so. It may be carried out using various symbols namely numerical marks or letter grades. But whatever symbols do we use should provide us valid measures of important educational outcomes. With careful thought and periodic review grades are found to be better indicators of educational progress than numerical marks even if they are derived from the latter.

The Department of Educational Measurement and Evaluation of the NCERT had brought out a monograph on *Grading in School* in March, 2000 which discusses in detail the adequacies and inadequacies of the prevailing numerical marking system vis-a-vis the proposed grading system. On receipt of this document certain minds expressed their apprehensions about the use of grades in admissions. They observed that the use of a nine-point grade system as against 101 point scale system would culminate in clustering of scores and thus would eventually lead to a number of tie cases. This inspired the department to take upon itself the responsibility of working out a proposal based on scientific rational to resolve any eventuality that might arise as a consequence of introduction of grades. The present document has beautifully demonstrated in its proposal by taking an example from the field situation. The entire document is divided into three chapters. The first chapter provides the context and the efforts made for the introduction of grades in the country. Chapter two outlines a number of grading models. The third chapter which is

the core of the document gives a detailed account of the proposed model. The model has been consciously described stepwise to make it simpler for its users.

I take this opportunity to express my gratitude to Professor J.S. Rajput who inspired me to do this monograph. But for his unstinted support and motivation it would not have been possible to bring out this document in its present form.

Two of my colleagues who have helped me whilst I was working on this project are, Dr S.K.S. Gautam and Dr Santosh Kumar Gupta. They richly deserve all my appreciation and thanks for their invaluable contribution.

My thanks are also due to my other colleagues, Dr I.K. Bansal and Dr A.D. Tiwari for their support.

I am also thankful to Shri N. Panicker and Shri Parash Ram Kaushik for their enthusiastic support in handling the text.

It is hoped that the present document will make a good reading in conjunction with the earlier monograph titled "Grading in School" and that it will find favour with its readers and users. Any suggestions for its improvement will be more than welcome.

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Introduction

1.1 The Context

Education is justifiably regarded as the principal means of human empowerment. Empowerment obviously requires development in a person of both cognitive and non-cognitive capacities to their fullest degree. Though difficult, they are not unachievable. There are three basic reasons for this optimism that each stakeholder essentially needs to know. One, that every child loves what s/he is good at. Two, that children learn at their own pace. Three, that it is a mistake to try to force them to learn at a different pace. These considerations should always be upper most in the minds of all those who are associated with education of children, be they the policy makers, managers, curriculum framers, pedagogues, teachers, parents, etc.

Human intellect is said to be so constituted that it does not allow measurement experts to conveniently and easily ascertain what it is good at and what its pace of learning. Indeed, it makes assessment of human potential very complex. Students vary widely in their learning style, which is that pattern of behaviour by which each learner approaches educational experiences. This behaviour is determined by a combination of genetic and environmental influences. While some students learn quickly when they hear, others learn best when they see the material in print. There are some who learn best in a formal situation, while others require an informal and relaxed environment. There are still others who require complete silence to concentrate, while others learn well in a noisy environment. There are some who require a lot of drilling, while others learn in the first attempt. In a situation of such diversity it is evident that no single technique of measurement, source of measurement, or criterion of measurement can sufficiently help measure the real human potential. And, it is precisely for this reason that measurement experts, the world over, advocate the application of multiple techniques of measurement, multiple sources of measurement and multiple criteria of measurement

to have a more precise and valid measure of human development.

Individual differences among students are inevitable regardless of the type of instruction or evaluation measures employed. These differences are so unpreventable that even with the adoption of individualized mastery learning approach, students are bound to differ both in rate and degree of mastery. Variation in the magnitude of learning would largely depend on input and process variables. The amount of variations infact gets amplified with heterogeneity of both input and process variables. Therefore, the notion, that individualized instruction and criterion-referenced testing will avoid disparities amongst students, seems to be based on quite unrealistic expectation of uniform achievement in learning by all students.

There is a strong desire for feedback in any human endeavour. People need to know how well things are going on, what are the inadequacies and how they can be overcome? In fact, it is an unending cycle which ought to move in a circular fashion. The personnel associated with it need to have the capability of identifying the weak lines so that timely corrective measures may be applied to keep the system moving on and on. It is in this context that evaluation plays a very significant role. It, in fact, is largely perceived to be a matter of quality control.

1.2 Impediments in Evaluation

Evaluation is a process of collecting, analyzing and interpreting evidences of students' achievement both in cognitive and non-cognitive areas of learning for the purposes of taking a variety of decisions pertaining to certification, promotion and placement. The first and foremost consideration associated with evaluation is the collection of evidence of learning. The key factors in it are the quality of instruments and the efficiency of observers who are employed for collection of evidence. While instruments here refer to question papers, rating scale, check-list of criteria etc., observers refer to paper setters and examiners. Invariably, quality of both these parameters is highly questionable which is why people are always suspicious about the reliability and validity of the evidence which is often cited to be the important parameter. Evidence so collected, therefore, always seems to have a fragile base.

Collection of evidence in evaluation is followed by its analysis and interpretation which make matters still worse. This may be attributed to the blinkered approach chiefly followed by its users. While analyzing evidence, its context is often ignored. Not only that, even the richness of the inputs is ignored and often background of a learner is disregarded. Similarly, while interpreting evidence we tend to forget the basic assumptions of the scale that is employed for assessing students on a hundred and one point scale. That is, on this scale zero is not an absolute zero, nor is hundred the absolute hundred; that zero does not represent nothingness of an attribute and that hundred does not represent the acquisition of the subject to the level of mastery; that the entire scale from zero to hundred is divided into hundred units of unequal sizes, that the difference between any two consecutive units does not remain the same as we move from the left to the right side of the scale. To top it all what is even worse is that an individual's performance is always viewed vis-a-vis the performance or his or her peer group. Other equally significant aspects like student's performance with reference to his or her own self and also with reference to the criteria laid down in terms of expected levels of attainments are not taken into consideration.

In preceding paragraphs we have also talked about two vital variables which too have far-reaching consequences in testing of human potential. They are: the quality of instruments and the efficiency of observers. Let us take them one by one. The quality of test papers is invariably questioned because of their varying difficulty values and low reliability, content validity and criterion-referenced validity. At times, it is stated that any amount of sampling of test contents would be far less inadequate a sample of total behavioural outcomes. The bias of paper setters and moderators makes it still worse. Consequently, a test criticized for providing a very truncated picture of students' potential. Arbitrary time limit allotted for answering individual questions and the test as a whole also affects students' performance. As regards efficiency of observers, it is very well known that we do not have ideal examiners and that their biases contribute to both intra and inter-examiner variability despite precautions like preparation of detailed marking scheme, vetting of scheme and sample checking by head examiners. These are some of the known factors which significantly contribute to errors in measurement which, when computed, provide

for an index of errors of measurement. Interestingly, the error of measurement is the sum of the outcome of a large number of factors, of which, some are identifiable and others not even identifiable. This error of measurement, which is more commonly known as standard error of measurement and which works in both positive and negative directions is reported to vary from 5 to 10 per cent in a paper carrying hundred marks where marks awarded by an examiner are accepted as they are i.e. in the form of raw scores. If we consider 10 as the standard error of measurement, the true score of a student who has been awarded a raw score of 40 might be anywhere between 30 and 50 in two out of three cases and between 20 and 60 in nineteen out of twenty cases and between 10 and 70 in all the cases. With so much of variation, classification of students on the basis of a single number is both contestable and unwarranted.

Having regard to the aforesaid discussion ranging from the nature of human intellect, inadequacies of instruments, inefficiency of observers, quantum of error of measurements and their consequences leading to wide variations between raw scores and true scores, it is proposed that students may be classified on the basis of ranges of scores rather than on the basis of a single number right score. Each range may be designated with a letter called a grade. Such a system would provide a more realistic measure of students' potential and avoid a number of imperfections associated with numerical marking system.

1.3 Grades are Necessary

Change does not always mean progress. However, progress is the most important product. Human development is considered a form of chronological unfairness, for those who come late benefit from the hard-work of their predecessors without paying the same price. Progress is gained through mistakes and their rectification. No good comes fully fashioned out of God's hands, but has to be carved out through repeated experiments and repeated failures by ourselves. Progress can be expedited if people develop the capability of seeing through the body of knowledge already collected by their antecessors. All big changes in human history have been arrived at slowly but of them, only those which are rational have survived. The responsibility for change lies with us.

1.4 Constraints

A question that is often asked by people is, why in all these years we have not changed from numerical marking to grading? The answer to that would seem to be: when a discipline originates it starts with a rudimentary knowledge which gradually traverses towards precision and improvement. Another answer could be ignorance, inertia and lack of will.

When we resorted to the use of numerical marking system, our understanding of the subject was nominal. The only consideration at that point of time was to quantify students' performance for the purpose of arriving at a variety of decisions. This gave rise to the development of an internal scale with a minimum of zero on one side and a maximum of hundred on the other side of the scale with the assumption that the entire scale is divided into hundred units of equal size. This found favour and over the years it was so institutionalized that people found it difficult to accept that students' achievement can be expressed in any other form than the numerical marks. This was the time when there was little understanding of the significance of a balanced question paper, intra and inter-examiner variability, factors contributing to error in measurement, content validity, reliability, criterion-referenced measurement, self-referenced measurement, norm-referenced measurement, inadequacies and imperfection of interval scale etc. With the passage of time, new ideas emerged. Attempts were initiated to perfect evaluation procedures. Measurement and evaluation emerged as a separate discipline. It attracted the best of the minds and of them, some had very solid scientific background. They suggested a number of alternate procedures.

Concerted efforts were made to perfecting evaluation procedures across nations. Statistics were extensively used by experts to identify basic parameters which in turn were used for setting question papers and analyzing and interpreting examination results. This was the era when people were counting on group dependent statistics. Subsequently, group dependent statistics came under severe criticism because of certain inherent limitations. This gave birth to sample free statistics which found favour with a large number of measurement experts.

The understanding of the subject reached a point when people

realized that classification of students in terms of marks was both unjust and indefensible and that a shift from numerical marking system to grading system was of paramount importance.

1.5 Efforts in India

In the light of the experiences of professionals, the University Education Commission (1948-49), which was the first Commission set up in independent India recognized the problems of examinations in the country. It came out heavily on the then existing system and observed that if they were to recommend a single reform in education in the country it would be the reform of examinations. The Commission underlined the significance of developing standardized tests and use of periodical tests, besides improving the reliability and validity of examinations. After a gap of three years another Commission was set up in 1952 to review and recommend the overhauling of secondary education in the country. In addition to other aspects of education, the Commission stressed the need to introduce continuous and comprehensive evaluation for the purpose of ensuring all round development of learner.

The third Commission viz. the Education Commission with Dr S.S. Kothari as Chairman which unlike the earlier ones looked at education more comprehensively and made significant recommendation on examinations. The Commission observed that testing should be diagnostic in nature and continuous and comprehensive evaluation should be gradually introduced in schools. Comparable standards to be achieved should be defined for each stage of education and that students' performance should be shown in terms of grades.

It was in 1975 when the NCERT, in its document "The Curriculum for the Ten-year School", proposed the use of five-point grades with no pass and fail in any examination. Consequently, the Central Board of Secondary Education (CBSE) made its first attempt to introduce subjectwise grades in its 1977 examinations. It had, however, to backtrack because of resistance from the managers of tertiary education. Realizing the significance of grades, the Council of Boards of Secondary Education (COBSE) set up a special Committee on scaling and grading under the Chairmanship of Shri A.E.T. Barrow in the year 1981. The Committee recommended that all the Boards in

the country should come together with a time frame and concurrently introduce a five point grade system. The Committee also recommended the abolition of pass and fail system. Further, it observed that the Boards might continue the award of marks on 101 point scale. However, in the prevailing circumstances the marks so awarded should be subsequently converted into grades.

The *National Policy on Education* (NPE) 1986 advocated the use of grades in place of marks. As a follow up of the Policy, the NCERT during its national seminar on scaling and grading held in 1987 made a strong case in favour of introduction of grades and recommended the use of a nine-point grade system. The NCERT in its Curriculum Framework–National Curriculum for Elementary and Secondary Education–1988 reiterated the replacement of marks by grades. As a result of these movements, the CBSE once again introduced a nine-point grade system in 1988 along with the conventional mode. This model of the CBSE creates an artificial divide between pass and fail. The pass percentage is falsely assumed to fall under a rectangular distribution which is divided into eight parts corresponding to eight grades, each containing equal number of cases that is twelve and-a-half per cent.

The review Committee on NPE, 1986 set up in 1990 recommended that students should be allowed to earn credits with a view to enabling them to move at their own pace and also for facilitating their movement across the Boards. The NPE Programme of Action, 1992 stressed the need for de-emphasizing external examinations and use of grades in place of marks. Two years later in 1994 the NCERT in its tenth Conference of the Chairpersons of Boards of School Education, recommended the use of a 9-point grade system throughout the country. The pros and cons of implementing grading system were again discussed during the annual Conference of the COBSE in 1999 at Kolkata. The Conference pleaded for the introduction of grades within a time frame. The issue of introducing grades was again discussed in the eleventh Conference of the Chairpersons of the Boards of School Education organized by the NCERT in February, 2000. The Conference endorsed the desirability of introducing grades. This was the time when the NCERT was engaged in organizing nation-wide discussions on its draft of the National Curriculum Framework for School Education. The document, finalized and brought

out in November, 2000, carries a separate chapter on evaluation. It has recommended the use of different methods of grading scholastic and co-scholastic achievement of students, for both school based and public examinations. In the context of the level of children studying in different classes, it has pleaded for the application of different point grade system for various stages of school education.

The Twelfth Conference of the Chairpersons of Boards of School Education was organized by the NCERT in September, 2001. During this conference it was recommended that a nine-point grade system should be concurrently introduced in the states by 2003 at the secondary level and by 2005 at the higher secondary level. It has also recommended that the grading should also be introduced at the lower stages of school education. Further, it was also recommended that the awareness programmes should be organized with a view to building a favourable climate across the states.

2

Grading Systems

2.1 Introduction

A shift from numerical marking to grading requires two decisions – the approach and the standard of judgement. It is the approach that determines whether we would like to opt for direct grading or indirect grading. And, it is the standard or judgement that arbitrates whether we go in for absolute grading or relative grading. In direct grading the performance of a student is assessed in qualitative terms which is consequently expressed in terms of letter grade. As against this, in indirect grading, students are assessed using conventional numerical marking mode and subsequently marks so awarded are converted into letter grades. Conversion may be carried out either by using absolute grading method or by relative grading method.

Each method has its own merits and demerits. They have been discussed in the earlier document "Grading in Schools" brought out by the NCERT in 2000, therefore they need not be discussed again. However, it would be pertinent to mention that in absolute grading, grades are based on pre-determined cut-offs. In relative grading which is also known as "grading on the curve", the obtained curve is transformed into the desired curve which happens to be the normal distribution curve or some symmetric variant of it. In this method the entire range which happens to be six sigma (6σ) may be divided into any number of segments depending upon one's requirement. Each segment refers to a particular letter grade. In relative grading method, the award of a grade to a particular student is not determined by his or her performance alone but is determined by his or her performance vis-à-vis the performance of the peer group.

Grading, indeed, has very little research basis. The need of the hour is to undertake serious projects with a view to establishing its superiority over the conventional mode of assessment. Concurrently, teacher preparation should also focus on grading. It will have greater

acceptability if it takes into account the pre-eminence of contextuality in school education besides being flexible enough to take into account differences in achievement over the years.

2.2 Shades of Grading

Grading system is a very popular mode of evaluating students' performance. It is quite extensively used all over the world, more so in the western world. Subsequent paragraphs provide glimpses of its use in a few selected countries.

2.2.1 Australia

In Australia public examinations in secondary schools are held at two levels: the General Certificate of Education (GCE) 'O' level also called Junior Secondary after 10 years of schooling and the General Certificate of Education (GCE) 'A' level also called Senior Secondary after 12 years of schooling. Both these levels are equivalent to Singapore's 'O' level and 'A' level examinations. Students in these examinations are graded on a 7-point scale i.e. Five for pass category and two for fail category as shown below:

	Grade	Per cent of Candidates
Pass	A	Top 10
	B	Next 15
	C	Next 15
	D	Next 15
	E	Next 18
Fail	O	Next 12
	F	Bottom 15

2.2.2 China

In China, recently in September 2000, an attempt was made in Beijing Primary Schools to replace 100 marks system by a grading system describing performance in terms of four grades given as under:
- Excellent
- Good
- Pass
- Fail

Sixty of each grade is based on overall achievement in a subject and remaining 40% on daily behaviour of a student.

2.2.3 Switzerland

The certificate and diploma courses in hotel management adhere to the absolute grade system given below. Eleven-point scale is employed for classification and certification of students undertaking these courses. The system of pass and fail does exist.

Percentages	Letter Grades	Grade's Significance	Point Value
90-100	A	Superior	4.00
87-89	A-	Excellent	3.70
83-86	B+	Very good	3.30
80-82	B	Good	3.00
77-79	B-	Above average	2.70
73-76	C+	Satisfactory	2.30
70-72	C	Pass	2.00
67-69	C-	Insufficient	1.70
64-66	D+	Poor	1.30
60-63	D	Very Poor	1.00
0-59	F	Fail	0.00
	TR	Transfer credit	
	I	Incomplete	
	R	Retake of course	
	*	Resit exam	

On completion of the course a final transcript based on these grades is issued by the institute.

2.2.4 The United Kingdom

General performance of students is reported in six grades – five for Pass category and one for Fail. Each grade has a performance description from elementary to excellence. Only knowledge and skills objectives are assessed through grading. Other aspects such as attitudes, values etc. are not tested but observed and reported separately. The grading system broadly used, across schools, is:

	Grade	Descriptor
Pass	A	Excellent level of Achievement
	B	High level of Achievement
	C	Average level of Achievement
	D	Satisfactory level of Achievement
	E	Elementary level of Achievement
Fail	N	Unsatisfactory level of Achievement (Fail)

This six point grading is used by teachers to award grades on the basis of the performance of students in their school.

2.2.5 The USA

In the US the system varies widely across states. Semester system based on credits is in vogue in schools and colleges of Kansas State. Five point grading system is in use. The following absolute grading scale is used in schools and colleges in the state:

Grade	Range of Marks
A	99-100
B	80-89
C	70-79
D	50-69
F	0-49

Grade F stands for fail in the semester. In addition to this, additional abbreviations included on the transcript are:

I   =   Incomplete
N   =   No credit
P   =   Credit for academic classes
K   =   Credit for non-academic classes
WP =   Withdrawn after pass
WF =   Withdrawn after fail

2.2.6 India

In India currently there are four models of grading available in the context of public examinations held at the end of secondary and senior secondary stages of school examination. They are the Central Board of Secondary Education (CBSE's) existing model. The Council for the Indian School Certificate Examinations (CISCE's) model, the NCERT's proposed model and the CBSE's proposed model. A detailed description of these models is given briefly:

(i) CBSE's Existing Model

The prevalent model of the CBSE provides initially for an artificial dichotomy. All those students who secure between zero and less than thirty three marks in a hundred marks paper are declared as failures. This entire chunk is arbitrarily segregated from the rest of the lot and placed in the category of 'E' grade. The remaining truncated group which constitutes the pass percentage is falsely assumed to fall under a rectangular distribution. It is subsequently divided into eight parts corresponding to eight grades, each containing equal number of cases (12.5%). In this procedure, though the number of cases are fixed in each grade ostensibly to rank ordering the students, the ranges of scores of each grade vary across subjects and over years making any kind of comparison almost impossible. Outwardly though this procedure appears to be simple to deal with, its deficiency is evident on several counts, including a false assumption of a rectangular distribution and use of dual criteria by creating an artificial divide between pass and fail.

(ii) CISCE's Model

The prevailing model of the CISCE, which has been in practice for several decades classifies students in nine grades. It is claimed that it defines the distribution through a flexible instrument addressing factual performances in various subjects. The method used is simple and straightforward, for it is based on absolute grading method that warrants the application of pre-determined cut-off points. One of its advantages is the possibility of giving advance instructions to the examiners to review borderline cases. Further, this may also help in ironing out some of the measurement errors due to clustering of scores.

On the other hand, one of its serious limitations is its perceived performance on a specific test instead of actual performance by way of equalizing the width of each grade regardless of three things, namely, unequal number of cases in each grade, quality of instrument and efficiency of the examiners. In such a situation, difficulty of the question paper is bound to influence shape of the distribution. Consequently, the number of cases in each grade will not only vary from subject to subject and from year to year but also across Boards which will eventually thwart the comparability of grades. This would, therefore, not allow additivity of grades to arrive at the Grade Point Average (GPA), since they are based on raw marks. Besides, use of pre-determined cut-offs might inject J-effect at each point which means an incremental incline on each point dividing two consecutive grades.

(iii) NCERT's Proposed Model

The NCERT has proposed a nine-point relative grading method. This method, based on a very sound rationale of normal probability distribution equalizing each interval and fixing the number of cases for each grade whilst varying them across grades, has a number of positive features. One, it eliminates negative effect of pass and fail as the performance of students is rated in terms of nine grades and no grade signifies the failure of students. Two, grades so awarded signify relative position of the individual student with respect of his or her group. Three, grades provide for comparability not only across subjects and the Boards but also over years to enable us to know whether our learning curve is going up or down or is static. Four, they also provide for meaningful additivity without distorting the scale of measurement and help us compute Grade Point Average (GPA) which in turn can profitably be exploited for admissions to higher classes including those of the tertiary stage of education. Five, difficulty of the question paper is not likely to affect distribution of grades. Six, it provides an opportunity to students to improve their grades. Lastly, their use will considerably reduce undue significance attached to raw marks which gives an illusion of happiness for a few but avoidable disappointment for many.

Unfortunately, a number of apprehensions are being expressed in certain quarters about the practicability of this model. One of them is that the model is likely to adversely affect students of government schools by pushing them towards the extreme left of the curve. This,

indeed, is a myth. Analysis of examination result in its present form reveals that we invariably get a larger lump towards the lower end of the scale and a slant towards the higher end of the scale. In such a situation, when obtained curve is transformed into the desired curve for awarding grades, a large number of students clustering into the lump will eventually get pushed up towards the higher end of the scale. Therefore, these so-called students from government schools will instead get advantage which will result in reducing tremendous wastage of human resource and de-motivation of students as is the case now. Another concern which is expressed by some public schools is that their students being brighter are likely to be pushed to the lower end of the scale since the model accepts only top 4% in the upper most grade. This is fallacious reasoning. Firstly, every student of these schools is not a ninety percenter. Secondly, accommodation of 4% of the cases in the top grade in a public examination which is written by about 500,000 students amounts to 20,000 cases which is fairly a large number. Once put in practice, the model can satisfy all those who are trying to make a mountain out of a mole hill. Yet another perception, that award of grades will create chaos in granting admission because of the large number of 'tie' cases, does not hold ground. 'Tie' cases can always be resolved by employing a twin criteria: the Weighted Grade Point Average (WGPA) and the preference for a particular stream. If 'tie' cases still persist, the problem can be conveniently resolved by providing additional weightage to related subject(s).

Despite all these positive features of the model, it has failed to receive favourable response for a variety of reasons. Of them, the first and the foremost is the usual resistance to change. Secondly, most people are unable to appreciate the merits of the system. Thirdly, lack of initiative on the part of educational institutions has failed to create a proper climate for its implementation. Last but not the least, is the reluctance of tertiary education sector to accept the proposed change.

(iv) CBSE's Proposed Model

The CBSE has also proposed a relative grading method which is almost a replica of the NCERT's model with slight variation and, that too, only in regard to its operational dimension. Unlike the NCERT,

the CBSE's model proposes an artificial dichotomy by declaring C_2 and above grades as qualifying grades and three bottom grades namely D_1, D_2 and E as unsatisfactory grades. Students who secure qualifying grades in at least four subjects including a language in Class X, will be awarded the certificates while all others will be given a statement of performance. Therefore, in this model, categorization of candidates as having passed or failed will continue to persist with the resultant frustration and wastage of human and material resources, an evil which has perpetuated since its introduction by the British in 1847.

The above discussion indicates that at present four models are available with us. It is possible to design yet another model by using the data from Board examinations for three years. Having done that, it would be possible to critically examine both positive and negative features of each model and eventually adopt the one that has more utility, advantage and feasibility. Analysis of Boards' results may be undertaken every third year with a view to making needed amendments in the chosen model. An upper most consideration in the entire exercise should, however, be to ensure that the highest grades go to those students who have achieved to the highest degree the objectives of instruction in a course; these grades must report the degree of achievement as precisely as possible under the circumstances. This reform, indeed, will restore the credibility of examinations in the country by ensuring objectivity and transparency, besides abolishing the practice of pass and fail, thus reducing fear of failure while at the same time instilling self confidence among learners.

3

How to Use Grades in Admissions

3.1 Introduction

People are apprehensive about the feasibility of introducing grades in the context of present day school practices. One of the issues which is often aroused is that the use of a nine-point grade system will result in a large number of 'tie' cases. This apprehension is based on the premise that squeezing of a 101-point scale into a 9-point scale will eventually lead to clustering of a number of cases. Further, it is feared that this might result in chaos while allocating seats in higher classes where the aspirants might outnumber available opportunities.

Clustering of cases is bound to be there. Nonetheless, it can not be good reason to put the grading on hold and to deprive the system of its merits which certainly outweigh all such minor impediments. What is in fact required is to design alternative solutions which can help resolve the issue of 'tie' cases. The present document makes an attempt to demonstrate how 'tie' cases can be dealt with by taking an example from the field.

It would seem desirable at this stage to reiterate some of the points made earlier even at the cost of some repetition since it is quite likely that some might like to go through this chapter without looking the earlier sections.

Currently students' achievement is evaluated in terms of marks using an interval scale that runs from 0 to 100. Assessment of students on a scale which distinguishes them on the basis of a single number score require absolute precision of judgement which is not humanly possible. Moreover, the scale that is used suffers from a number of imperfections, including arbitrary nature of both 0 and 100, inadequacies of tools, inter and intra examiner variabilities, etc. As a consequence of these limitations, marks awarded do not represent the true abilities of students. So much so, a mark of 50 with a standard error of 10 may turn out to be between 40 and 60 in 2 out of 3 cases,

between 30 and 70 in 19 out of 20 cases and between 20 and 80 in all cases. In view of such wide variations, assessment of students' achievement on an interval scale is totally unjustifiable. These shortcomings can be overcome to a great extent if students are placed in ability bands which represent ranges of scores. Each ability band may be designated with a letter called a "Grade". It seems necessary at this stage to draw attention to the following:

- That all possible methods employed for assessment of human potential have problems.
- That it would be naive to assume that a shift from marking to grading would remedy all defects of the conventional system.
- That of the two methods under reference, grading is far more superior than numerical marking system.

Grading may be carried out in a variety of ways. The method that we have proposed for use in public examinations is "Grading on the Curve", which entails transformation of obtained curve into a desired curve. This conversion allows us to categorize the obtained scores into a number of grades as per our requirement in a scientific manner. The proposed method has a number of positive features which include:

- Negative effect of pass and fail will be completely eliminated as the performance of individual students will be rated in terms of grades and no-grade will signify failure of students.
- Grades so awarded will indicate relative position of an individual student vis-a-vis his/her group and thus serve the purpose of norm-referencing.
- Grades will provide for comparability across curricular areas because normal distribution ensures uniformity in spread of scores regardless of the nature of subjects.
- Grades may meaningfully be used for recording growth and development of individual students in both cognitive and non-cognitive learning outcomes.
- Grades will provide for meaningful additivity without distorting the scale of measurement, if it is decided to compute the Grade Point Average (GPA) and the Weighted Grade Point Average (WGPA).
- Undue significance attached to raw scores will be considerably reduced.
- Test difficulty would not affect distribution of grades.

3.2 Method of Resolving 'Tie' cases

Grading on the curve allows additivity of grades for computation of Grade Point Average (GPA) and Weighted Grade Point Average (WGPA) and that too without distorting the scale of measurement. It is this feature more than any other which has been very carefully exploited whilst designing proposed method of resolving 'tie' cases. The method is based on the twin criteria which primarily takes into account the WGPA coupled with preference exercised by individual students to pursue educational streams of their choice. The illustration that has been taken here from the field situation pertains to post-secondary stage wherein 125 students of Class X of a particular school supposed to have been awarded grades using grading on the curve method. Having graduated from Class X, these students seemed to have exercised their options to seek admissions in different streams namely Science, Commerce and Humanities available at the penultimate class of the higher secondary stage where we have only 40 seats in each stream. With this premise the entire exercise has been carried out using the following steps:

Step 1

The first and the foremost requirement is to convert the letter grades into grade values as shown below:

Table 1: Showing Letter Grades and Grade Values

S.No.	Letter Grade	Grade Value
1.	A	9
2.	B	8
3.	C	7
4.	D	6
5.	E	5
6.	F	4
7.	G	3
8.	H	2
9.	I	1

Step 2

Each student might have been awarded either of these grades in each subject area. If there are five subjects then every student is bound to receive five letter grades commensurating with his or her performance. For computation of GPA add the grade values of all the subjects and divide it by the total number of subjects (N). This will allow computation of GPA for all students.

Step 3

If a student wishes to pursue higher education in a particular stream we need to identify firstly a related subject which is essential as a pre-requisite for chosen stream and secondly provide double weightage by re-adding the corresponding grade value of the related subject.

To put it in a simpler way, we may add grade value of the related subject to the total grade value to arrive at the weighted grade value and divide it by (N + 1) to compute the WGPA.

Step 4

Let us assume that there are three streams in Class XI namely the Science, Commerce and Humanities. Let us now consider science subject as a related subject for Science stream, mathematics for Commerce stream and social studies for Humanities stream. With this background we may now compute WGPA in respect of all the three streams for all 125 students. This would, therefore, give us three WGPAs for every student as shown below in Table 2.

Table 2 : Showing GPA and WGPA for all the Streams

Roll No.	Grades awarded in					Total Grade Value	GPA	WGPA Commerce	WGPA Science	WGPA Humanities
	Maths	Science	English	Social Studies	Hindi					
1.	C	B	C	C	B	37	7.40	7.33	7.50	7.33
2.	F	D	B	B	B	34	6.80	6.33	6.67	7.00
3.	B	D	D	C	D	33	6.60	6.83	6.50	6.17
4.	D	A	F	F	F	27	5.40	5.50	6.00	5.17
5.	D	E	E	D	F	26	5.20	5.33	5.17	5.33

Roll No.	Grades awarded in					Total Grade Value	GPA	WGPA Commerce	WGPA Science	WGPA Humanities
	Maths	Science	English	Social Studies	Hindi					
6.	E	C	D	C	E	30	6.00	5.83	6.17	6.17
7.	G	G	A	A	A	33	6.60	6.00	6.00	7.00
8.	F	D	F	E	F	23	4.60	4.50	4.83	4.67
9.	I	B	F	G	G	19	3.80	3.33	4.50	3.67
10.	A	F	D	D	D	31	6.20	6.67	5.83	6.17
11.	G	C	E	D	E	26	5.20	4.83	5.50	5.33
12.	E	D	F	F	F	23	4.60	4.67	4.83	4.50
13.	D	H	C	C	C	29	5.80	5.83	5.17	6.00
14.	H	F	G	F	G	16	3.20	3.00	3.33	3.33
15.	C	D	D	D	D	31	6.20	6.33	6.17	6.17
16.	F	G	I	I	I	10	2.00	2.33	2.17	1.83
17.	E	D	E	E	E	26	5.20	5.17	5.33	5.17
18.	D	I	D	E	C	25	5.00	5.17	4.33	5.00
19.	D	C	F	F	F	25	5.00	5.17	5.33	4.83
20.	B	E	D	D	D	31	6.20	6.50	6.00	6.17
21.	G	B	B	B	A	36	7.20	6.50	7.33	7.33
22.	E	G	G	G	G	17	3.40	3.67	3.33	3.33
23.	E	D	C	C	B	33	6.60	5.83	6.50	6.67
24.	F	E	F	E	F	22	4.40	4.33	4.50	4.50
25.	G	H	E	H	F	17	3.40	3.33	3.17	3.17
26.	C	A	D	E	E	32	6.40	6.50	6.83	6.17
27.	G	C	A	A	A	37	7.40	6.67	7.33	7.67
28.	F	E	H	H	G	16	3.20	3.33	3.50	3.00
29.	D	F	E	E	E	25	5.00	5.17	4.83	5.00
30.	F	D	D	D	D	28	5.60	5.33	5.67	5.67
31.	E	D	F	E	F	24	4.80	5.83	5.00	4.83
32.	B	E	C	C	C	34	6.80	7.00	6.50	6.83
33.	D	C	E	E	F	27	5.40	5.50	5.67	5.33
34.	D	B	D	E	D	31	6.20	6.17	6.50	6.00
35.	A	F	F	G	G	23	4.60	5.33	4.50	4.33
36.	G	E	E	D	E	24	4.80	4.50	4.83	5.00
37.	F	G	C	D	B	28	5.60	5.33	5.17	5.67
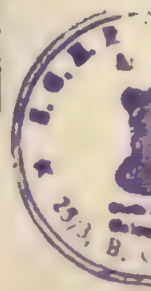
Roll No.	Grades awarded in					Total Grade Value	GPA	WGPA Commerce	WGPA Science	WGPA Humanities
	Maths	Science	English	Social Studies	Hindi					
38.	C	D	F	F	F	25	5.00	5.33	5.17	4.83
39.	I	F	E	E	F	15	3.00	2.67	3.17	3.33
40.	F	E	H	G	E	19	3.80	3.83	4.00	3.67
41.	E	H	D	C	D	26	5.20	5.17	4.67	5.50
42.	G	C	G	F	G	20	4.00	3.83	4.50	4.00
43.	D	G	E	F	E	23	4.60	4.83	4.33	4.50
44.	F	D	F	F	F	22	4.40	4.33	4.67	4.33
45.	G	F	B	A	B	32	6.40	5.83	6.00	6.83
46.	B	E	C	C	C	34	6.80	7.00	6.50	6.83
47.	E	H	H	H	H	13	2.60	3.00	2.50	2.50
48.	C	F	G	G	G	20	4.00	4.50	4.00	3.83
49.	E	C	E	D	E	28	5.60	5.50	5.83	5.67
50.	D	I	I	I	I	10	2.00	2.67	1.83	1.83
51.	G	G	A	A	B	32	6.40	5.83	5.83	6.83
52.	B	E	F	G	F	24	4.80	5.33	4.83	4.50
53.	F	F	D	D	D	26	5.20	5.00	5.00	5.33
54.	D	A	E	E	E	30	6.00	6.00	6.50	5.83
55.	A	G	H	H	H	18	3.60	4.50	3.50	3.33
56.	D	E	B	A	B	36	7.20	7.00	6.83	7.50
57.	C	D	G	G	G	22	4.40	4.83	4.67	4.17
58.	E	H	C	C	C	28	5.60	5.50	5.00	5.83
59.	F	B	H	G	H	19	3.80	3.83	4.50	3.67
60.	E	E	F	E	F	23	4.60	4.67	4.67	4.67
61.	D	C	E	F	E	25	5.00	5.17	5.33	4.83
62.	B	F	G	C	H	24	4.80	5.33	4.67	5.17
63.	H	G	D	D	D	23	4.60	4.17	4.33	4.83
64.	E	E	H	H	E	19	3.80	4.00	4.00	3.50
65.	D	E	G	F	G	21	4.20	4.50	4.33	4.17
66.	C	I	C	C	D	28	5.60	5.67	4.83	5.83
67.	B	D	E	E	E	29	5.80	6.17	5.83	5.67
68.	E	B	B	B	B	37	7.40	7.00	7.50	7.50
69.	E	E	D	C	D	29	5.80	5.67	5.67	6.00

Roll No.	Grades awarded in					Total Grade Value	GPA	WGPA Com-merce	WGPA Science	WGPA Huma-nities
	Maths	Science	English	Social Studies	Hindi					
70.	F	F	F	E	F	21	4.20	4.17	4.17	4.33
71.	G	G	E	E	E	21	4.20	4.00	4.00	4.33
72.	G	D	G	G	G	18	3.60	3.50	4.00	3.50
73.	E	E	C	C	C	31	6.20	6.00	6.00	6.17
74.	I	F	D	D	D	23	4.60	4.00	4.50	4.83
75.	C	I	I	I	I	11	2.20	3.00	2.00	2.00
76.	F	E	E	F	E	23	4.60	4.50	4.67	4.50
77.	D	G	H	H	D	19	3.80	4.17	3.67	3.50
78.	F	H	F	F	F	18	3.60	3.67	3.33	3.67
79.	B	C	E	E	E	30	6.00	6.33	6.17	5.83
80.	E	F	D	D	D	27	5.40	5.33	5.17	5.50
81.	E	E	B	C	C	32	6.40	6.17	6.17	6.50
82.	G	D	C	D	D	28	5.60	5.17	5.67	5.67
83.	D	G	G	G	G	18	3.60	4.00	3.50	3.50
84.	H	F	G	H	H	13	2.60	2.50	2.83	2.50
85.	C	B	E	E	E	30	6.00	6.17	6.33	5.83
86.	E	C	F	F	F	24	4.80	4.83	5.17	4.67
87.	F	G	I	I	I	10	2.00	2.33	2.17	1.83
88.	D	A	E	F	E	29	5.80	5.83	6.33	5.50
89.	I	E	D	E	D	23	4.60	4.00	4.67	4.67
90.	A	F	C	C	C	34	6.80	7.17	6.33	6.83
91.	E	D	E	E	F	25	5.00	5.00	5.17	5.00
92.	H	E	F	F	F	19	3.80	3.50	4.00	3.83
93.	C	H	G	G	G	18	3.60	4.17	3.33	3.50
94.	H	E	A	A	A	34	6.80	6.00	6.50	7.17
95.	E	C	E	E	E	27	5.40	5.33	5.67	5.33
96.	C	F	C	D	C	31	6.20	6.17	5.83	6.17
97.	F	F	G	G	H	16	3.20	3.33	3.33	3.17
98.	H	D	F	F	F	20	4.00	3.67	4.33	4.00
99.	H	F	B	B	B	30	6.00	5.33	5.67	6.33
100.	F	C	D	D	D	29	5.80	5.50	6.00	5.83
101.	D	D	F	F	F	24	4.80	5.00	5.00	4.67

Roll No.	Grades awarded in					Total Grade Value	GPA	WGPA Commerce	WGPA Science	WGPA Humanities
	Maths	Science	English	Social Studies	Hindi					
102.	E	G	C	D	C	28	5.60	5.50	5.17	5.67
103.	F	D	E	E	E	25	5.00	4.83	5.17	5.00
104.	G	F	B	B	C	30	6.00	5.50	5.67	6.33
105.	C	G	G	G	H	18	3.60	4.17	3.50	3.50
106.	H	E	B	B	C	30	6.00	5.33	5.83	6.33
107.	D	I	F	G	G	17	3.40	3.83	3.00	3.33
108.	I	C	E	E	E	23	4.60	4.00	5.00	4.67
109.	A	D	D	E	D	32	6.40	6.83	6.33	6.17
110.	E	B	G	G	G	22	4.40	4.50	5.00	4.17
111.	F	E	I	H	I	13	2.60	2.83	3.00	2.50
112.	E	D	H	H	D	19	3.80	4.00	4.17	3.50
113.	D	H	A	B	A	34	6.80	6.67	6.00	7.00
114.	F	D	E	E	D	26	5.20	5.00	4.67	5.17
115.	C	F	E	F	E	25	5.00	5.33	4.83	4.83
116.	H	C	H	H	H	15	3.00	2.83	3.67	2.83
117.	D	H	C	D	C	28	5.60	5.67	5.00	5.67
118.	G	A	D	D	C	31	6.20	5.67	6.67	6.17
119.	E	F	F	F	F	21	4.20	4.33	4.17	4.17
120.	B	E	G	G	H	21	4.20	4.83	4.33	4.00
121.	E	G	F	F	G	19	3.80	4.00	3.67	3.83
122.	F	D	C	D	C	30	6.00	5.67	6.00	6.00
123.	G	F	E	E	E	22	4.40	4.17	4.33	4.50
124.	C	C	D	D	D	32	6.40	6.50	6.50	6.33
125.	B	B	B	B	D	38	7.60	7.67	7.67	7.67

Step 5

Once the three WGPAs in respect of individual students have been worked out, students can be asked to indicate their preferences for the streams. Every student may be allowed to exercise only two preferences namely the first and the second. The third preference will automatically be considered in case a student fails to get a seat of his or her first and second preference.

Step 6

On receipt of preferences we need to ascertain the number of students opting for different streams so as to prioritize the streams. The stream which attracts the maximum number of first preferences may be considered as the first stream. This may be decided on the basis of data indicated in Table 3.

Table 3 : Showing Individual Preferences

Roll No.	GPA	reference I	Preference II
1	7.40	S	C
2	6.80	S	C
3	6.60	C	S
4	5.40	S	C
5	5.20	C	S
6	6.00	S	H
7	6.60	S	C
8	4.60	S	H
9	3.80	S	C
10	6.20	S	C
11	5.20	S	C
12	4.60	S	C
13	5.80	C	H
14	3.20	S	C
15	6.20	S	C
16	2.00	S	C
17	5.20	S	H
18	5.00	C	H
19	5.00	S	C
20	6.20	S	C
21	7.20	S	C
22	3.40	S	C
23	6.60	C	H
24	4.40	S	C
25	3.40	S	C

Roll No.	GPA	Preference I	Preference II
26	6.40	S	C
27	7.40	C	H
28	3.20	S	H
29	5.00	S	C
30	5.60	S	C
31	4.80	C	S
32	6.80	C	S
33	5.40	S	C
34	6.20	S	C
35	4.60	S	H
36	4.80	S	C
37	5.60	S	C
38	5.00	C	S
39	3.00	C	S
40	3.80	C	S
41	5.20	C	S
42	4.00	S	C
43	4.60	S	C
44	4.40	C	S
45	6.40	C	S
46	6.80	S	C
47	2.60	C	S
48	4.00	S	C
49	5.60	C	S
50	2.00	S	C
51	6.40	C	H
52	4.80	H	S
53	5.20	S	H
54	6.00	S	C
55	3.60	S	C
56	7.20	H	S
57	4.40	C	S
58	5.60	C	H

Roll No.	GPA	Preference I	Preference II
59	3.80	S	C
60	4.60	S	C
61	5.00	S	C
62	4.80	H	C
63	4.60	S	C
64	3.80	S	C
65	4.20	S	C
66	5.60	S	C
67	5.80	S	C
68	7.40	H	C
69	5.80	S	C
70	4.20	C	S
71	4.20	C	S
72	3.60	C	S
73	6.20	S	C
74	4.60	S	C
75	2.20	S	C
76	4.60	C	S
77	3.80	C	S
78	3.60	S	C
79	6.00	S	C
80	5.40	C	S
81	6.40	S	C
82	5.60	C	S
83	3.60	S	C
84	2.60	C	H
85	6.00	C	H
86	4.80	S	C
87	2.00	C	S
88	5.80	S	C
89	4.60	S	C
90	6.80	H	S
91	5.00	C	H

Roll No.	GPA	Preference I	Preference II
92	3.80	S	C
93	3.60	S	C
94	6.80	H	C
95	5.40	S	C
96	6.20	S	C
97	3.20	C	S
98	4.00	S	C
99	6.00	S	C
100	5.80	C	S
101	4.80	C	S
102	5.60	S	C
103	5.00	S	C
104	6.00	S	C
105	3.60	S	C
106	6.00	C	S
107	3.40	C	S
108	4.60	C	S
109	6.40	S	C
110	4.40	S	C
111	2.60	H	S
112	3.80	H	S
113	6.80	S	C
114	5.20	H	C
115	5.00	S	C
116	3.00	C	S
117	5.60	S	C
118	6.20	C	S
119	4.20	S	C
120	4.20	S	C
121	3.80	S	C
122	6.00	S	C
123	4.40	S	H
124	6.40	S	C
125	7.60	C	H

It is evident from Table 3 that while 77 students have given science as their first preference, only 39 and 9 indicated respectively commerce and humanities as their first choice. A detailed account of the preferences exercised by all 125 students is summarized in Table 4.

Table 4 : Preference for the Streams

Stream	1st Preference	2nd Preference
Science	77	34
Commerce	39	74
Humanities	9	17
Total	125	125

A graphical presentation of the preferences exercised by individual students is shown below:

Students' Preferences for Different Streams

Ⓩ Science ☐ Commerce ☒ Humanities
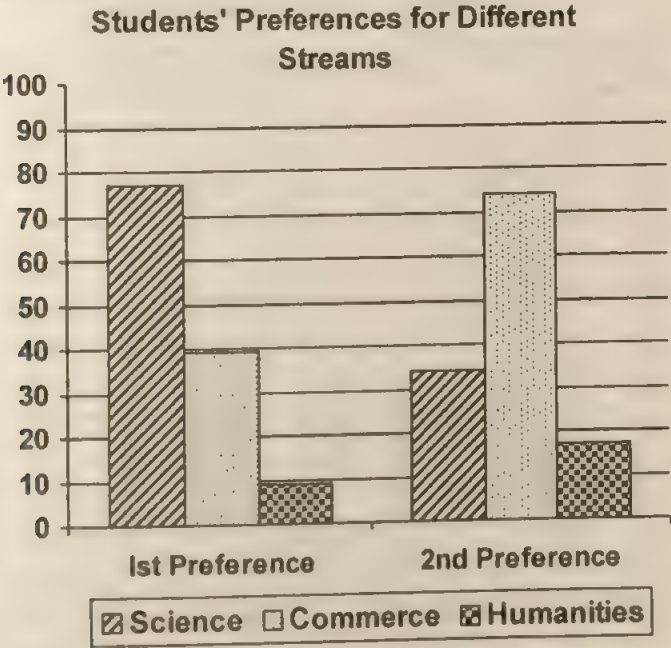
Step 7

In the preceding step science turns out to be the first stream of preference. Therefore, the seats will be allocated for science stream

using the twin criteria. For this let us first arrange students in a descending order on the basis of their WGPA for the first stream and then start allocating seats using the twin criteria of WGPA coupled with first preference for the first stream. It may be pertinent to mention here that during this process only candidates who have given first preference for science will be considered since the number of candidates opting for science as the first choice is more than the number of available seats. While doing so 'tie' cases, if any, can be resolved in favour of candidate(s) with higher grade in the related subject of the stream. If 'tie' cases still persist, second related subject may be taken into consideration. If there are still some more 'tie' cases, then one can look up grades in language which will be the medium of instructions at the higher secondary stage.

Table 5 illustrates the allotment of seats in the science stream.

Table 5: Allotment of Seats in Science

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
1	7.67	125	C	H		
2	7.50	1	S	C	1	
3	7.50	68	H	C		
4	7.33	21	S	C	2	
5	7.33	27	C	H		
6	6.83	26	S	C	3	
7	6.83	56	H	S		
8	6.67	2	S	C	4	
9	6.67	118	C	S		
10	6.50	3	C	S		
11	6.50	23	C	H		
12	6.50	32	C	S		
13	6.50	34	S	C	5	
14	6.50	46	S	C	6	
15	6.50	54	S	C	7	
16	6.50	94	H	C		
17	6.50	124	S	C	8	

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
18	6.33	85	C	H		
19	6.33	88	S	C	9	
20	6.33	90	H	S		
21	6.33	109	S	C	10	
22	6.17	6	S	H	11	
23	6.17	15	S	C	12	
24	6.17	79	S	C	13	
25	6.17	81	S	C	14	
26	6.00	4	S	C	15	
27	6.00	7	S	C	16	
28	6.00	20	S	C	17	
29	6.00	45	C	S		
30	6.00	73	S	C	18	
31	6.00	100	C	S		
32	6.00	113	S	C	19	
33	6.00	122	S	C	20	
34	5.83	10	S	C	21	
35	5.83	49	C	S		
36	5.83	51	C	H		
37	5.83	67	S	C	22	
38	5.83	96	S	C	23	
39	5.83	106	C	S		
40	5.67	30	S	C	24	
41	5.67	33	S	C	25	
42	5.67	69	S	C	26	
43	5.67	82	C	S		
44	5.67	95	S	C	27	
45	5.67	99	S	C	28	
46	5.67	104	S	C	29	
47	5.50	11	S	C	30	
48	5.33	17	S	H	31	

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
49	5.33	19	S	C	32	
50	5.33	61	S	C	33	
51	5.17	5	C	S		
52	5.17	13	C	H		
53	5.17	37	S	C	34	
54	5.17	38	C	S		
55	5.17	80	C	S		
56	5.17	86	S	C	·35	
57	5.17	91	C	H		
58	5.17	102	S	C	36	
59	5.17	103	S	C	37	
60	5.00	31	C	S		
61	5.00	53	S	H	38	
62	5.00	58	C	H		
63	5.00	101	C	S		
64	5.00	108	C	S		
65	5.00	110	S	C	39	
66	5.00	117	S	C	40	
67	4.83	8	S	H		
68	4.83	12	S	C		

Abbr: S = Science Stream
       C = Commerce Stream
       H = Humanities Stream

The figures posted in Table 5 indicate that all 40 seats have been conveniently filled in as there has not been any 'tie' cases. The list so prepared may be treated as tentative until all cases for all three streams have been considered in detail.

Step 8

Having completed the allocation of seats in science stream, we may now take up the second stream which happens to be commerce.

As earlier we can arrange the students in a descending order on the basis of their WGPA for the commerce stream. Serial numbers of all candidates who have been allotted seats for the first stream may be flagged to avoid duplication while allocating seats for the second stream. Seats may be allocated using the twin criteria of WGPA coupled with first preference for the second stream. Concurrently, the left over cases who have given first preference for the first stream and second preference for the second stream may also be considered. 'Tie' cases, if any, may be resolved using the same criteria as proposed for the allocation of seats in science stream.

Table 6 indicates the allotment of all the 40 seats in the commerce stream:

Table 6: Showing the Allotment of Seats in Commerce

S.No.	WGPA Commerce	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
1	7.67	125	C	H	1	
*2	7.33	1	S	C		
3	7.17	90	H	S		
4	7.00	32	C	S	2	
*5	7.00	46	S	C		
6	7.00	56	H	S		
7	7.00	68	H	C		
8	6.83	3	C	S	3	
*9	6.83	109	S	C		
*10	6.67	10	S	C		
11	6.67	27	C	H	4	
*12	6.67	113	S	C		
*13	6.50	20	S	C		
*14	6.50	21	S	C		
*15	6.50	26	S	C		
*16	6.50	124	S	C		
*17	6.33	2	S	C		
*18	6.33	15	S	C		
*19	6.33	79	S	C		

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
*20	6.33	96	S	C		
*21	6.17	67	S	C		
*22	6.17	81	S	C		
23	6.17	85	C	H	5	
*24	6.17	34	S	C		
*25	6.00	7	S	C		
*26	6.00	54	S	C		
*27	6.00	73	S	C		
28	6.00	94	H	C		
*29	5.83	6	S	H		
30	5.83	13	C	H	6	
31	5.83	23	C	H	7	
32	5.83	31	C	S	8	
33	5.83	45	C	S	9	
34	5.83	51	C	H	10	
35	5.83	66	S	C	11↑	
*36	5.83	88	S	C		
*37	5.67	69	S	C		
*38	5.67	117	S	C		
39	5.67	118	C	S	12	
*40	5.67	122	S	C		
*41	5.50	4	S	C		
*42	5.50	33	S	C		
43	5.50	49	C	S	13	
44	5.50	58	C	H	14	
45	5.50	100	C	S	15	
*46	5.50	102	S	C		
*47	5.50	104	S	C		
48	5.33	5	C	S	16	
*49	5.33	30	S	C		
50	5.33	35	S	H		
*51	5.33	37	S	C		

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
52	5.33	38	C	S	17	
53	5.33	52	H	S		
54	5.33	62	H	C		
55	5.33	80	C	S	18	
*56	5.33	95	S	C		
*57	5.33	99	S	C		
58	5.33	106	C	S	19	
59	5.33	115	S	C	20 ↑	
*60	5.17	17	S	H		
61	5.17	18	C	H	21	
*62	5.17	19	S	C		
63	5.17	29	S	C	22↑	
64	5.17	41	C	S	23	
*65	5.17	61	S	C		
66	5.17	82	C	S	24	
*67	5.00	53	S	H		
68	5.00	91	C	H	25	
69	5.00	101	C	S	26	
70	5.00	114	H	C		
*71	4.83	11	S	C		
72	4.83	43	S	C	27↑	
73	4.83	57	C	S	28	
*74	4.83	86	S	C		
*75	4.83	103	S	C		
76	4.83	120	S	C	29↑	
77	4.67	12	S	C	30↑	
78	4.67	60	S	C	31↑	
79	4.50	8	S	H		
80	4.50	36	S	C	32↑	
81	4.50	48	S	C	33↑	
82	4.50	55	S	C	34↑	
83	4.50	65	S	C	35↑	

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks	
84	4.50	76	C	S	36		
*85	4.50	110	S ·	C			
86	4.33	24	S	C	37↑		
87	4.33	44	C	S	38		
88	4.33	119	S	C	39↑		
						Grade in Maths	*Grade in Hindi*
89	4.17	63	S	C		H	
90	4.17	70	C	S		F	
91	4.17	77	C	S		D	
92	4.17	93	S	C	40↑	C	G
93	4.17	105	S	C		C	H
94	4.17	123	S	H			
95	4.00	64	S	C			
96	4.00	71	C	S			
97	4.00	74	S	C			
98	4.00	83	S	C			

Two important points need to be highlighted in the context of Table 6. One, cases marked with a straight arrow in column number six are the cases which have exercised first preference for science and second preference for commerce. Since their WGPA in science turned out to be lower than the last candidate given a seat in science, they have been excluded from that list. And, now since their WGPA in commerce which is their second preference turned out to be higher than several others opting for commerce, they have been allocated berths in commerce stream.

Two, there are as many as six 'tie' cases with identical WGPA of 4.17 ranging from serial numbers 89 to 94. Candidate at serial number 94 bearing roll number 123 is the one who has neither exercised his first nor second preference for commerce. Consequently, there are only five 'tie' cases instead of six.

Since 39 seats have been already allocated only the 40th seat remaining to be allocated from amongst the five 'tie' cases, this requires

consideration of their grades in the related subject of mathematics. This reveals that there are still two candidates bearing roll numbers 93 and 105 with identical grades (C) in mathematics which happen to be higher than the other three cases.

This requires looking up their grades in language which is their medium of instruction at the higher secondary stage. Assuming Hindi as their medium of instructions, we look up their grades in Hindi. Since candidate bearing roll number 93 is with a higher grade (G) then roll number 105 (H), the last seat goes to roll number 93.

The list so prepared may be treated as tentative until all the cases for all the streams are duly considered.

Step 9

Now we are left with humanities stream where we have to consider all the remaining 45 cases for 40 seats. As earlier we may firstly arrange students in a descending order on the basis of their WGPA for the third stream. Subsequently, we may flag all those candidates who have been allotted seats for the first and the second streams to avoid duplication whilst allocating seats for the third stream. Consequently, we may allocate seats on the basis of the sole criterion of WGPA for the third stream.

The following table illustrates the allotment of 40 seats in Humanities stream.

Table 7: Showing Allotment of Seats in Humanities

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
1	7.67	27♠	C	H		
2	7.67	125♠	C	H		
3	7.50	56	H	S	1	
4	7.50	68	H	C	2	
5	7.33	*1	S	C		
6	7.33	*21	S	C		
7	7.17	94	H	C	3	
8	7.00	*2	S	C		
9	7.00	*7	S	C		

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
10	7.00	*113	S	C		
11	6.83	32♠	C	S		
12	6.83	45♠	C	S		
13	6.83	*46	S	C		
14	6.83	51♠	C	H		
15	6.83	90	H	S	4	
16	6.67	*20	S	C		
17	6.67	23♠	C	H		
18	6.50	*81	S	C		
19	6.33	*99	S	C		
20	6.33	*104	S	C		
21	6.33	106♠	C	S		
22	6.33	*124	S	C		
23	6.17	3♠	C	S		
24	6.17	*6	S	H		
25	6.17	*10	S	C		
26	6.17	*15	S	C		
27	6.17	*26	S	C		
28	6.17	*73	S	C		
29	6.17	*96	S	C		
30	6.17	*109	S	C		
31	6.17	118♠	C	S		
32	6.00	13♠	C	H		
33	6.00	*34	S	C		
34	6.00	*69	S	C		
35	6.00	*122	S	C		
36	5.83	*54	S	C		
37	5.83	58♠	C	H		
38	5.83	66♠	S	C		
39	5.83	*79	S	C		
40	5.83	85♠	C	H		
41	5.83	100♠	C	S		

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
42	5.67	*30	S	C		
43	5.67	37♦	S	C		
44	5.67	49♦	C	S		
45	5.67	*67	S	C		
46	5.67	82♦	C	S		
47	5.67	102♦	S	C		
48	5.67	117♦	S	C		
49	5.50	41♦	C	S		
50	5.50	80♦	C	S		
51	5.50	*88	S	C		
52	5.33	5♦	C	S		
53	5.33	*11	S	C		
54	5.33	*33	S	C		
55	5.33	*53	S	H		
56	5.33	*95	S	C		
57	5.17	*4	S	C		
58	5.17	*17	S	H		
59	5.17	62	H	C	5	
60	5.17	114	H	C	6	
61	5.00	18♦	C	H		
62	5.00	29♦	S	C		
63	5.00	36♦	S	C		
64	5.00	91♦	C	H		
65	5.00	*103	S	C		
66	4.83	*19	S	C		
67	4.83	31♦	C	S		
68	4.83	38♦	C	S		
69	4.83	*61	S	C		
70	4.83	63	S	C	7	
71	4.83	74	S	C	8	
72	4.83	115♦	S	C		
73	4.67	8	S	H	9	

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks
74	4.67	60▲	S	C		
75	4.67	*86	S	C		
76	4.67	89	S	C	10	
77	4.67	101▲	C	S		
78	4.67	108	C	S	11	
79	4.50	12▲	S	C		
80	4.50	24▲	S	C		
81	4.50	43▲	S	C		
82	4.50	52	H	S	12	
83	4.50	76▲	C	S		
84	4.50	123	S	H	13	
85	4.33	35	S	H	14	
86	4.33	44	C	S		
87	4.33	70	C	S	15	
88	4.33	71	C	S	16	
89	4.17	57▲	C	S		
90	4.17	65▲	S	C		
91	4.17	*110	S	C		
92	4.17	119▲	S	C		
93	4.00	42	S	C	17	
94	4.00	98	S	C	18	
95	4.00	120▲	S	C		
96	3.83	48▲	S	C		
97	3.83	92	S	C	19	
98	3.83	121	S	C	20	
99	3.67	9	S	C	21	
100	3.67	40	C	S	22	
101	3.67	59	S	C	23	
102	3.67	78	S	C	24	
103	3.50	64	S	C	25	
104	3.50	72	C	S	26	
105	3.50	77	C	S	27	

S.No.	WGPA Science	Roll No.	Preference I	Preference II	Sr. No. of the seat allotted	Remarks	
106	3.50	83	S	C	28		
107	3.50	93♠	S	C			
108	3.50	105	S	C	29		
109	3.50	112	H	S	30		
110	3.33	14	S	C	31		
111	3.33	22	S	C	32		
112	3.33	39	C	S	33		
113	3.33	55♠	S	C			
114	3.33	107	C	S	34		
115	3.17	25	S	C	35		
116	3.17	97	C	S	36		
117	3.00	28	S	H	37		
118	2.83	116	C	S	38		
						Grade in Maths	*Grade in Hindi*
119	2.50	47	C	S	39	H	H
120	2.50	84	C	H	40	H	H
121	2.50	111	H	S		H	I
122	2.00	75	S	C			
123	1.83	16	S	C			
124	1.83	50	S	C			
125	1.83	87	C	S			

It is clear from Table 7 that of the 40 seats, 38 seats could be filled in without any problem. But as we move further we find that there are 3 'tie' cases with identical WGPA of 2.50. To resolve the ties in favour of two out of three we consider their grades in the related subject of social studies. Interestingly, here the cases turn out to be identical, that is 'H' in all the three cases. Subsequently, we looked up for their grades in language as we did while resolving 'tie' cases in commerce. Their grades in language turned out to be H, H and I which is why both remaining seats numbering 39th and 40th went in favour of candidates bearing roll numbers 47 and 84.

It may be pertinent to highlight here that out of 125 candidates, as many as 120 candidates have been given seats in different streams. Five candidates could not get seats because of the availability of limited number of seats. Such a situation where the number of aspirants are more than the seats, application of an administrative decision is required.

Step 10

Once we are through with the process of allotment of seats in all streams, we may prepare a final list indicating the WGPA of every student and display it on to the notice board of the school for the consumption of one and all including the students and the parents as shown in Table 8. This will obviously help us ensure both objectivity and transparency in the allotment of seats.

Table 8: Showing Final Allotment of Seats in all the Streams

Science Stream			Commerce Stream			Humanities Stream		
S.No.	Roll No.	WGPA	S.No.	Roll No.	WGPA	S.No.	Roll No.	WGPA
1	1	7.50	1	125	7.67	1	56	7.50
2	21	7.33	2	32	7.00	2	68	7.50
3	26	6.83	3	3	6.83	3	94	7.17
4	2	6.67	4	27	6.67	4	90	6.83
5	34	6.50	5	85	6.17	5	62	5.17
6	46	6.50	6	13	5.83	6	114	5.17
7	54	6.50	7	23	5.83	7	63	4.83
8	124	6.50	8	31	5.83	8	74	4.83
9	88	6.33	9	45	5.83	9	8	4.67
10	109	6.33	10	51	5.83	10	89	4.67
11	6	6.17	11	66	5.83	11	108	4.67
12	15	6.17	12	118	5.67	12	52	4.50
13	79	6.17	13	49	5.50	13	123	4.50
14	81	6.17	14	58	5.50	14	35	4.33
15	4	6.00	15	100	5.50	15	70	4.33
16	7	6.00	16	5	5.33	16	71	4.33

Science Stream			Commerce Stream			Humanities Stream		
S.No.	Roll No.	WGPA	S.No.	Roll No.	WGPA	S.No.	Roll No.	WGPA
17	20	6.00	17	38	5.33	17	42	4.00
18	73	6.00	18	80	5.33	18	98	4.00
19	113	6.00	19	106	5.33	19	92	3.83
20	122	6.00	20	115	5.33	20	121	3.83
21	10	5.83	21	18	5.17	21	9	3.67
22	67	5.83	22	29	5.17	22	40	3.67
23	96	5.83	23	41	5.17	23	59	3.67
24	30	5.67	24	82	5.17	24	78	3.67
25	33	5.67	25	91	5.00	25	64	3.50
26	69	5.67	26	101	5.00	26	72	3.50
27	95	5.67	27	43	4.83	27	77	3.50
28	99	5.67	28	57	4.83	28	83	3.50
29	104	5.67	29	120	4.83	29	105	3.50
30	11	5.50	30	12	4.67	30	112	3.50
31	17	5.33	31	60	4.67	31	14	3.23
32	19	5.33	32	36	4.50	32	22	3.33
33	61	5.33	33	48	4.50	33	39	3.33
34	37	5.17	34	55	4.50	34	107	3.33
35	86	5.17	35	65	4.50	35	25	3.17
36	102	5.17	36	76	4.50	36	97	3.17
37	103	5.17	37	24	4.33	37	28	3.00
38	53	5.00	38	44	4.33	38	116	2.83
39	110	5.00	39	119	4.33	39	47	2.50
40	117	5.00	40	93	4.17	40	84	2.50

The entire exercise has been explained stepwise which is why it might appear to be a little cumbersome to some. But the fact is that it does not require high level of mathematical skills. It involves simple computation of GPA and WGPA. Moreover, for those institutions which have access to computer facilities, the job will require fifteen to twenty minutes.

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